UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,312	11/13/2001	Leroy E. Hood	P - IS 4988	5632

23601 7590 09/07/2004	EXAMINER
CAMPBELL & FLORES LLP	SMITH, CAROLYN L

CAMPBELL & FLORES LLP
4370 LA JOLLA VILLAGE DRIVE
7TH FLOOR
SAN DIEGO, CA 92122

ART UNIT	PAPER NUMBER
1631	

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/993,312	HOOD ET AL.
	Examiner	Art Unit
	Carolyn L Smith	1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _15 June 2004_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-74_ is/are pending in the application.

    4a) Of the above claim(s) _34 and 44-74_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-33 and 35-43_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) _1-74_ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Applicant's amendments and remarks, filed 6/15/04, are acknowledged.

Amended claim 1 is acknowledged.

Applicant's arguments, filed 6/15/04, have been fully considered but they are not

deemed to be persuasive. Rejections and/or objections not reiterated from the previous

office actions are hereby withdrawn. The following rejections and/or objections are

either reiterated or newly applied. They constitute the complete set presently being

applied to the instant application.

If Applicants disagree with the restriction requirement, they may file a petition.

Claims 1-33 and 35-43 are herein under examination.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

The rejection of claims 1-33 and 35-43 is maintained under 35 U.S.C. 101

because the claims are directed to non-statutory subject matter.

This rejection is maintained and reiterated for reasons of record.

As written, the claims appear to lack any physical result performed outside of a

computer.

As stated in MPEP § 2106, (IV)(2)(b), to be statutory, a claimed computer-related

process must either: (A) result in a physical transformation outside the computer for

which a practical application in the technological arts is either disclosed in the

specification or would have been known to a skilled artisan (discussed in MPEP § 2106

(IV)(2)(b)(i)), or (B) be limited to a practical application within the technological arts

(discussed in MPEP § 2106 (IV)(2)(b)(ii)).

As stated in MPEP § 2106 (IV)(2)(b)(i), the independent physical acts may be

post- or pre-computer processing activity as described below:

> A process is statutory if it requires physical acts to be performed outside the
> computer
> independent of and following the steps to be performed by a programmed
> computer,
> where those acts involve the manipulation of tangible physical objects and result
> in the
> object having a different physical attribute or structure. Diamond v. Diehr, 450
> U.S. at
> 187, 209 USPQ at 8. Thus, if a process claim includes one or more post-computer
> process steps that result in a physical transformation outside the computer
> (beyond
> merely conveying the direct result of the computer operation), the claim is clearly
> statutory.

> Another statutory process is one that requires the measurements of physical
> objects or
> activities to be transformed outside of the computer into computer data (In re
> Gelnovatch, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data-
> gathering step did not measure physical phenomenon); Arrhythmia, 958 F.2d at
> 1056,
> 22 USPQ2d at 1036), where the data comprises signals corresponding to physical
> objects or activities external to the computer system, and where the process
> causes a
> physical transformation of the signals which are intangible representations of the
> physical
> objects or activities. Schrader, 22 F.3d at 294, 30 USPQ2d at 1459 citing with
> approval
> Arrhythmia, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38; Abele, 684 F.2d at
> 909,
> 214 USPQ at 688; In re Taner, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA
> 1982).

As stated in MPEP § 2106 (IV)(2)(b)(ii), the computer-related process may be

limited to a practical application in the technological arts as described below:

> There is always some form of physical transformation within a computer because
a
> computer acts on signals and transforms them during its operation and changes
the state
> of its components during the execution of a process. Even though such a physical
> transformation occurs within a computer, such activity is not determinative of
> whether the process is statutory because such transformation alone does not
> distinguish a statutory
> computer process from a nonstatutory computer process. What is determinative is
not
> how the computer performs the process, but what the computer does to achieve a
> practical application. See Arrhythmia, 958 F.2d at 1057, 22 USPQ2d at 1036.

Claims 1-33 and 35-43 do not fulfill either of these statutory requirements and are

therefore rejected under 35 U.S.C. 101 because the claims are directed to non-statutory

subject matter.

The rejection of claims 1-33 and 35-43 is maintained under 35 U.S.C. 101

because the claims are directed to non-statutory subject matter. As written, the claims

appear to be directed to a method that merely manipulates numbers, abstract concepts or

ideas, or signals representing any of the foregoing.

As stated in MPEP § 2106, (IV)(B)(1), If the "acts" of a claimed process

manipulate only numbers, abstract concepts or ideas, or signals representing any of the

foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d

at 294-95, 30 USPQ2d at 1458-59. Thus, a process consisting solely of mathematical

operations, i.e., converting one set of numbers into another set of numbers, does not

manipulate appropriate subject matter and thus cannot

constitute a statutory process.

In practical terms, claims define nonstatutory processes if they:

– consist solely of mathematical operations without some claimed practical application
(i.e., executing a "mathematical algorithm"); or
– simply manipulate abstract ideas, e.g., a bid (Schrader, 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759), without some claimed practical application.

Claims 1-33 and 35-43 do not fulfill any of these statutory requirements and are therefore rejected under 35 U.S.C. 101 because the claims are directed to non-statutory subject matter.

Applicants state the sections of the MPEP submitted by the Examiner are under the "Safe Harbors" section. MPEP section 2106 (IV)(B)(2)(b)(i) and (ii) were described to make the Applicants aware of what is considered statutory and nonstatutory, as examples of both are included in the arguments previously set forth (reiterated above). As one interpretation of the claims includes an invention without any steps outside of the computer, the claims are considered to be nonstatutory. In order to have a practical application, there must be a physical step (outside of the computer) that must take place.

Applicants quote MPEP section § 2106 (IV)(B)(2)(b)(ii) including the following:

"For example, a computer process that simply calculates a mathematical algorithm that models noise is nonstatutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory."

The instant invention appears to fit into the nonstatutory category listed above directed to modeling noise. This is because the instant method appears to be performing

computer-related functions representing a type of modeling without providing any sort of

physical application that could be construed as being a practical application, such as the

noise filtering in the example given above. Such a physical application would provide a

practical application that could lead to a concrete, tangible, and useful result that would

make the invention statutory. The current claims lack such a practical application and are

thus considered to be nonstatutory.

Applicants cite sections of the specification (i.e. page 8, lines 3-8 and page 9,

lines 5-10) that state how the predicting of a biochemical system can be used. These

putative uses are not included in the instant claims, and it is these claims are what are

relied on to determine statutory or nonstatutory subject matter. Appropriately placing in

the claims a useful function or physical step outside the computer would be sufficient to

remove the nonstatutory rejections, because a useful, concrete, and tangible result would

now be set forth in the claims.

Claims Rejected Under 35 U.S.C. § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming
the subject matter which the applicant regards as his invention.

The rejection of claims 16-33 and 35-43 is maintained under 35 U.S.C. 112,

second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which the applicant regards as the invention.

These rejections are maintained and reiterated for reasons of record.

Claims 16 (line 6) and 32 (line 7) recite the phrase "said value sets" which is

rejected due to the unclarity of this phrase. In claim 16, part (a), "value sets of two..."

are contained in the first data integration map. Then, part (b), the second data integration

map is stated as containing "said value sets...". The "said value sets" phrase is

reasonably pointing to these value sets in the first data integration map and therefore are

not perturbed "value sets" as might be expected in the production of the second data

integration map in part (b). Thus, the content of the second and first data integration

maps seems to be identical. It is unclear if Applicants wanted to have the value sets in

the second, perturbed, data integration map to be different due to the perturbation. This

option seems, however, to be precluded by the word "said" in the phrase "said value sets"

in part (b) of claim 16. It is also unclear how there can be a change in value sets as

identified in part (c) of claim 16 with the value sets being the same between the first and

second data integration maps. The same issue is present in claim 32. Clarification of this

issue via clearer claim wording is requested. Claims 17-31, 33, and 35-43 are also

rejected due to their dependency from claims 16 and 32.

Applicants state "value set" is defined as a set of two or more types of data, thus

the phrase refers to the type of data element rather than the magnitude or change in value

of the data type. This statement is found unpersuasive as the magnitude or change in

value can be considered to be "data types" in the broadest reasonable interpretation of the

phrase.

Claims 30 and 42 require the repeating of steps (b) and (c). This is confusing as

such repeats will produce multiple second data integration maps. It is unclear what

correlation is therefore determinative of the comparison of part (c) with multiple second

data integration maps. Clarification of this issue via clearer claim wording is requested.

Applicants state claims 30 and 42 recite more than one iteration and identification

of correlative changes between the first data integration or physical interaction map and a

second map and these further iterations and identifications do not render the claims

unclear. Applicants submit each production of a second data integration map or physical

interaction map predicts a behavior of the biochemical system. This statement is found

unpersuasive as the presence of multiple second data integration maps appears to muddle

the correlation procedure.

Claim Rejections – 35 USC §102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The rejection of claims 1-33 and 35-43 is maintained under 35 U.S.C. 102(a) as

being anticipated by Stoughton et al. (P/N 6,351,712).

This rejection is maintained and reiterated for reasons of record.

Stoughton et al. disclose methods for predicting expression levels (behaviors) of

cells (biochemical system) in response to a perturbation (abstract). Stoughton et al.

disclose comparing microarray profiles (data integration maps that are physical

interaction maps) with other profiles (col. 2, line 45). These profiles contain a collection

of quantitative measurements (value sets of data elements) of various behaviors, such as

the following three value sets: gene expression levels, mRNA abundance, and protein

expression levels, that change in response to drug treatments (physical interactions) and

other perturbations in the cell (col. 1, lines 14-27 and 38-41) which represent different

conditions. The term "network" is broadly defined in several ways in the instant

specification (page 10, line 26 to page 11, line 32) which includes a group of interacting

molecules in two or more pathways and have common function in a biochemical

function. A "network" is also defined as containing one or more components involved in

a biochemical function which could be interpreted to be a cell, nucleic acid, or countless

other cellular component parts. Thus, two cells involved in each microarray as discussed

by Stoughton et al. would qualify as two independent networks. Stoughton et al. disclose

comparing different pools of nucleic acid on microarrays involving one pool of cell

culture exposed to a pathway perturbation and another pool of cell culture not exposed to

a pathway perturbation (col. 9, lines 16-36). The pool of nucleic acid exposed to a

pathway or drug perturbation represent perturbed conditions for substantially all

components within a network (col. 3, lines 28-31), as stated in claims 8 and 23.

Stoughton et al. disclose comparing microarrays with control DNA and perturbed DNA

(col. 9, lines 40-49) and, alternatively, using DNA from a different perturbed state of the

biological system (col. 9, lines 52-54) which illustrates using one or more perturbed

conditions in at least three networks. Stoughton et al. disclose a scanned image on a graphics program that is then analyzed using an image gridding program to create a spreadsheet (col. 10, lines 33-41) which further illustrates the data integration map. Stoughton et al. disclose applying perturbations (drugs) at several levels of strength to a biological system to observe responses and interpolating responses (col. 18, lines 5-14). Stoughton et al. disclose using least squares fit (col. 18, line 28) and correlation coefficients between profiles (col. 23, lines 10-18). Stoughton et al. disclose classifying profiles according to their similarity to profiles of known biological significance, such as response patterns for known drugs or perturbations in specific biological pathways (value sets) (col. 23, lines 14-18). Stoughton et al. disclose measuring induced changes in transcript level of at least 2 genes to more than 1000 genes (col. 17, lines 40-45) which is represents at least five components for each network, as stated in claims 14, 29, and 41. Stoughton et al. disclose running repeat experiments (col. 4, lines 33-36) so that the correlative changes discussed above include value sets within the same network, as stated in claims 9 and 24. The experiments discussed above that contain exposure and non-exposure of drugs contain value set within different networks, as stated in claims 10, 25, and 38. Stoughton et al. disclose genes increasing or decreasing their expression in groups when they possess similar regulatory sequence patterns which results in coordinated response (expression data elements) to particular signaling inputs (col. 18, lines 56-61), as stated in claims 12, 27, and 39. Stoughton et al. disclose genetic redundancy caused by gene duplications and its evolution in networks of transcriptional regulators will tend to co-vary to the extent mutations have not led to functional divergence in regulatory regions (col. 19, lines 1-6).

Thus, Stoughton et al. anticipate the instant invention.

Applicants state a value set to mean two or more types of data elements that

characterize a component of a biochemical system.   Applicants' reference to the term

"component" on page 15 is very broad with various "for examples" which do not provide

an explicit definition of the term. The phrase "data element" (page 18, last two

paragraphs) includes the broad definition of a value or other analytical representation of

factual information describing a characteristic or property of biochemical system or

component of a biochemical system. These so-called definitions illustrate the broad

circumstances under which the phraseology may be interpreted. Therefore, when

Stoughton et al. disclose using mRNA abundance as well as gene and protein expression

data, this represents multiple data types or value sets, as discussed in the rejection above.

Comparing microarray profiles of various cell cultures (exposed vs. not exposed to

perturbation) is a form of comparing and identifying correlative changes in value sets.

Applicants' arguments are considered unpersuasive, such that the rejection is maintained.

The rejection of claims 1-33 and 35-43 is maintained under 35 U.S.C. 102(b) as

being anticipated by Rine et al. (P/N 5,777,888).

This rejection is maintained and reiterated for reasons of record.

Rine et al. disclose a method for generating and analyzing (comparing) an output

signal matrix to an output signal matrix database (containing other matrices) for

correlating candidate stimuli and responses (abstract and col. 1, line 66 to col. 2, line 3

and col. 2, lines 25-29). Rine et al. disclose constructing a stimulated physical matrix

(data integration map which is a physical interaction map) and detecting a physical signal

(value) at each unit of the physical matrix and storing the data with X and Y coordinates

of the corresponding physical matrix unit and stimulus, and repeating this procedure to

form a database (col. 2, lines 4-15). Rine et al. disclose performing comparisons to

generate correlates and qualititative and/or quantitative deduction analyses (col. 5, lines

56-63). Rine et al. disclose using this procedure in testing drug administration

(perturbation and physical interaction) to identify compounds with a particular biological

effect (col. 1, lines 40-57). Rine et al. disclose using an array containing a different

responder of a living thing in each unit which may be genes, gene regulatory elements,

gene transcripts or translates, or a predetermined functional class or subset of the

organism's entire repertoire (col. 2, lines 30-44) which represent at least three networks.

Rine et al. disclose deducing the action of a stimulus on the living thing's responders

(col. 2, lines 42-44). Rine et al. disclose steps to generate various response profiles

(including value sets) for known and unknown stimuli (col. 2, lines 60-64). Rine et al.

disclose using various conditions/perturbations, including pharmaceutical agent stimuli,

suspected pathogenic agents, and radiative energy (col. 3, lines 48-51) which represent

two or more perturbed conditions. Rine et al. disclose using a wide variety of stimuli and

adjusting incubation conditions to preclude cellular stress (col. 3, lines 59-63). Rine et al.

disclose measuring gene expression levels in cells (behavior data elements) (col. 4, lines

11-17). Rine et al. disclose measuring cells of the matrix before and after interactions

with a pharmacological agent which might include monitoring as a function of other

variables such as stimulus intensity, duration, or time (col. 4, lines 51-57), which

represents repeated measurements on at least three value sets (as stated in claims 11, 26, and 38) with perturbed conditions for substantially all components within at least one network. Rine et al. disclose performing comparisons to deduce the mechanism of action and characteristics of the responsible stimulus (col. 5, lines 37-49) which represents a prediction of cell behavior (expression level of a biochemical system), as stated in claims 1, 16, and 32. Rine et al. disclose similarities in a shared response pathway in sterol biosynthesis between human cells and yeast cells resulting increased expression levels but in different nucleic acids when exposed to drug Mevacor (col. 6, lines 14-28). Rine et al. disclose using a microtiter plate to test an inhibitor on various strains of yeast which various in no expression, increased expression, or decreased expression depending on the strains (col. 6, lines 44-54) which represents inversely coordinated changes in nucleic acid expression data elements, as stated in claims 12, 27, and 39. The term "network" is broadly defined in several ways in the instant specification (page 10, line 26 to page 11, line 32) that includes a group of interacting molecules in two or more pathways and have common function in a biochemical function. A "network" is also defined as containing one or more components involved in a biochemical function which could be interpreted to be a cell, nucleic acid, or countless other cellular component parts. Thus, two cells involved in each microarray as discussed by Rine et al. would qualify as two independent networks. Rine et al. disclose using a microtiter plate with 96 wells with a cell or colony of cells in each well (col. 10, lines 38-41) which represent at least 96 networks. Values taken during the drug interaction measurements over time as discussed above in a 96-well microtiter plate represent value

sets within the same network (measurements in the same well) as well as within different

networks (measurements in different wells) as stated in claims 9, 10, 24, 25, and 38.

Thus, Rine et al. anticipate the instant invention.

Applicants state Rine et al. do not describe an integration map and identification

of correlative changes between two or more value sets containing two or more different

types of data. This statement is found unpersuasive as the instant claims do not require

the value sets of the two or more data types to be different. The presence of multiple

cells in multiple microarrays and the data collected therefrom are reasonably interpreted

to be encompassed within the phrase "value set". Rine et al. disclose constructing a

stimulated physical matrix that clearly represents a data integration map that is a physical

interaction map. Applicants' arguments are considered unpersuasive, such that the

rejection is maintained.

Conclusion

No claim is allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of

time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technical Center 1600 by

facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO

Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the

notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61

(November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR §1.6(d)). The

CM1 Fax Center number is (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Carolyn Smith, whose telephone number is (571) 272-

0721. The examiner can normally be reached Monday through Thursday from 8 A.M. to

6:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Michael Woodward, can be reached on (571) 272-0722.

Any inquiry of a general nature or relating to the status of this application should

be directed to Legal Instruments Examiner Tina Plunkett whose telephone number is

(571) 272-0549.

ARDIN H. MARSCHEL
PRIMARY EXAMINER

August 24, 2004